

REMARKS

This is in response to the Office Action of November 24, 2003. With this response, claims 1 and 11 are amended, claims 8 and 18 are canceled and all pending claims are presented for reconsideration and favorable action.

In the Office Action, the Examiner rejected claims 1, 2, 5, 11, 12, 15 and 21 under 35 U.S.C. § 103 based upon Vestergaard et al. (US 4,196,385) in view of Uchida (JP 2000241364). The remaining claims 3, 4, 8, 13, 14 and 18 were rejected further in view of Marrelli (US 5,763,794).

For the Examiner's reference, a copy of the Japanese Publication of the Uchida reference 2000-241364 is enclosed herewith at Appendix A.

Initially, Applicant notes that the Uchida reference does not appear to teach a pulse based microwave method or technique. Instead, Uchida only refers to a 300 MHz, or above, microwave signal which is directed toward a fluid. Uchida describes comparing the reflected signal with the transmitted signal and determining a phase difference which is then used to determine fluid concentration.

Uchida is similar to the Scott et al. reference which was applied in the previous Office Action in that it does not use pulse based techniques. Instead, these prior art references rely upon a continuous signal.

In contrast, the present invention utilizes pulses to determine concentration. The claimed invention uses the time delay of a return pulse or the energy level of the return pulse to make the concentration determination. The pulse based technique of the present invention requires lower power than continuous microwave transmitters. The independent claims have been amended to clarify that the present invention is implemented in a process control transmitter which is coupled to a two wire process control loop. This process control loop is used both for

carrying information related to the calculated concentration as well as providing power to completely power circuitry within the process transmitter. Such two wire process control loops are capable of providing only a limited amount of power to components coupled to the loop. The claimed pulse based technique advantageously reduces power consumption for such an environment. The Japanese Uchida reference, particularly in view of the previously cited Scott reference, teach away from the claimed pulse based technique and direct one to the use of a continuous signal.

For the above reasons, the rejections to the claims should be withdrawn.

Applicant further notes that the dependent claims contain a number of configurations which are not shown or suggested by the references. For example, the dependent claims include configurations in which the microwave antenna is a pitot tube, in which microwaves are carried along interior or exterior surfaces of the pitot tube, configurations in which the microwave antenna is curved, and configurations in which the microwave antenna extends in the direction of fluid flow. These dependent claims are not shown or suggested in the combination set forth with the independent claims. For this additional reason, these dependent claims are allowable over the cited prior art.

In view of the above amendments and remarks, it is believed that the present application is in condition for allowance. Consideration and favorable action are respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: 

~~Juddson K. Champlin, Reg. No. 34,797~~  
Suite 1600 - International Centre  
900 Second Avenue South  
Minneapolis, Minnesota 55402-3319  
Phone: (612) 334-3222 Fax: (612) 334-3312

JKC:lrs